



Text Part Number: 78-6837-01
Customer Order Number: DOC-786837=

Upgrading DRAM on the VIP2-10, VIP2-15, or FEIP2

Product Number: VIP2-10/15/FE2-UPG=

Introduction

This publication provides instructions for upgrading the dynamic random-access memory (DRAM) on the second-generation Versatile Interface Processor—VIP2-10 and VIP2-15— and the second-generation Fast Ethernet Interface Processor (FEIP2). (For convenience, the VIP2-10, VIP2-15, and FEIP2 are hereafter referred to as the interface processor, with differences noted.)

This DRAM upgrade is required *only* if you have any one of these interface processors installed in your Cisco 7000 series or Cisco 7500 series router, and if your router is running any of the Cisco IOS Release 12.0-based software images. The DRAM upgrade requires you to remove the interface processor from the system in which it is installed; therefore, to minimize network downtime, we strongly recommend that you plan your upgrade accordingly, and upgrade several simultaneously.

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Determining Whether a DRAM Upgrade Is Required

To determine whether a DRAM upgrade is required, you must determine what type of interface processors are installed in your system, and then determine your Cisco IOS software release.

Note We strongly recommend that you upgrade VIP2-10, VIP2-15, or FEIP2 DRAM if you have any one of these interface processors installed in your Cisco 7000 series or Cisco 7500 series router, *and* if your router is running any of the Cisco IOS Release 12.0-based software images.

If one of these interface processors is installed in your Cisco 7000 series or Cisco 7500 series router, and your router is running a Cisco IOS Release 12.0 software image, you will see the following display at system startup:

```
Cisco Internetwork Operating System Software
IOS (tm) VIP Software (SVIP-DW-M), Version 12.0(3)T, RELEASE SOFTWARE (fc1)
Copyright (c) 1986-1999 by cisco Systems, Inc.
Compiled Mon 22-Feb-99 17:37 by biff
Image text-base:0x600108F0, data-base:0x6025E000

SYSTEM INIT:INSUFFICIENT MEMORY TO BOOT THE IMAGE!

CYASIC Error Interrupt register 0x20000000
CYASIC Other Interrupt register 0x0
CYBUS Error register 0x0, PKT Bus Error register 0x0
System Reload called from 0x600BF16C
```

Note If you see the preceding display, you must upgrade your VIP2-10, VIP2-15, or FEIP2 DRAM to be able to use a Cisco IOS Release 12.0 software image with these interface processors.

To determine the type of interface processors installed in your system, use the **show diag slot** command, where *slot* is an interface processor slot number in your router. You can also use the **show diag** command without the *slot* argument to display all the interface processors in your router.

- The following output of the **show diag slot** command is from a system with a VIP2-10 installed; the VIP2-10 has 8 MB of DRAM:

```
Router# show diag 10
Slot 10:
  Physical slot 10, ~physical slot 0x5, logical slot 10, CBus 0
  Microcode Status 0x4
  Master Enable, LED, WCS Loaded
  Board is analyzed
  Pending I/O Status:None
  EEPROM format version 1
  VIP2 controller, HW rev 2.04, board revision D0
  Serial number:03709026 Part number:73-1684-03
  Test history:0x00          RMA number:00-00-00
  Flags:cisco 7000 board; 7500 compatible

  EEPROM contents (hex):
    0x20:01 15 02 04 00 38 98 62 49 06 94 03 00 00 00 00
    0x30:68 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

  Slot database information:
  Flags:0x4          Insertion time:0x389930C (00:04:07 ago)

  Controller Memory Size:8 MBytes DRAM, 512 KBytes SRAM
```

(Additional displayed text omitted from this example.)

- The following output of the **show diag slot** command is from a system with a VIP2-15 installed; the VIP2-15 has 8 MB of DRAM:

```
Router# show diag 10
Slot 10:
  Physical slot 10, ~physical slot 0x5, logical slot 10, CBus 0
  Microcode Status 0x4
  Master Enable, LED, WCS Loaded
  Board is analyzed
  Pending I/O Status:None
  EEPROM format version 1
  VIP2 controller, HW rev 2.04, board revision D0
  Serial number:03709026 Part number:73-1684-03
  Test history:0x00          RMA number:00-00-00
  Flags:cisco 7000 board; 7500 compatible

  EEPROM contents (hex):
    0x20:01 15 02 04 00 38 98 62 49 06 94 03 00 00 00 00
    0x30:68 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

  Slot database information:
  Flags:0x4          Insertion time:0x38EDD14 (00:03:21 ago)

  Controller Memory Size:8 MBytes DRAM, 1024 KBytes SRAM
```

(Additional displayed text omitted from this example.)

- The following output of the **show diag slot** command is from a system with an FEIP2 installed; the FEIP2 has 8 MB of DRAM:

```
Router# show diag 10
Slot 10:
  Physical slot 10, ~physical slot 0x5, logical slot 10, CBus 0
  Microcode Status 0x4
  Master Enable, LED, WCS Loaded
  Board is analyzed
  Pending I/O Status:None
  EEPROM format version 1
  FEIP2 controller, HW rev 2.04, board revision D0
  Serial number:04544011 Part number:73-1684-03
  Test history:0x00          RMA number:00-00-00
  Flags:cisco 7000 board; 7500 compatible

  EEPROM contents (hex):
    0x20:01 20 02 04 00 45 56 0B 49 06 94 03 00 00 00 00
    0x30:68 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

  Slot database information:
  Flags:0x4          Insertion time:0x3941CBC (00:02:11 ago)

  Controller Memory Size:8 MBytes DRAM, 1024 KBytes SRAM

  PA Bay 0 Information:
    Fast-Ethernet PA, 1 ports, 100BaseTX-nISL
    EEPROM format version 1
    HW rev 1.00, Board revision A0
    Serial number:04645436 Part number:73-1790-03

  PA Bay 1 Information:
    Fast-Ethernet PA, 1 ports, 100BaseTX-nISL
    EEPROM format version 1
    HW rev 1.00, Board revision A0
    Serial number:04645455 Part number:73-1790-03
```

Note If you determine that you require the interface processor DRAM upgrade, proceed to the following sections of this publication to perform the upgrade.

Tools and Parts Required

You need the following tools and parts to upgrade DRAM on your interface processor:

- DRAM upgrade kit VIP2-10/15/FE2-UPG=, which includes two 8-MB DRAM single in-line memory modules (SIMMs)
- Number 1 Phillips screwdriver
- 3/16-inch flat-blade screwdriver
- Your own ESD-prevention equipment or the disposable grounding wrist strap included with all upgrade kits, field-replaceable units (FRUs), and spares
- An antistatic mat or antistatic foam

If you need additional equipment, contact a service representative for ordering information.

Safety Guidelines

Following are safety guidelines that you should follow when working with any equipment that connects to electrical power, or which might be sensitive to electrostatic discharge (ESD) damage.

Electrical Equipment Guidelines

Follow these basic guidelines when working with any electrical equipment:

- Before beginning any procedures requiring access to the chassis interior, locate the emergency power-off switch for the room in which you are working.
- Disconnect all power and external cables before moving a chassis.
- Do not work alone when potentially hazardous conditions exist.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard or makes the equipment unsafe.
- Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

Electrostatic Discharge Prevention Guidelines

Electrostatic discharge (ESD) damage, which can occur when electronic cards or components are improperly handled, results in complete or intermittent failures.

Use the following guidelines for preventing ESD damage:

- Always use an ESD wrist or ankle strap and ensure that it makes good skin contact; connect the equipment end of the strap to an unfinished chassis surface.
- Avoid contact between the printed circuit boards and clothing. The wrist strap only protects components from ESD voltages on the body; ESD voltages on clothing can still cause damage.



Warning For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 Megohms (Mohms).

Removing an Interface Processor

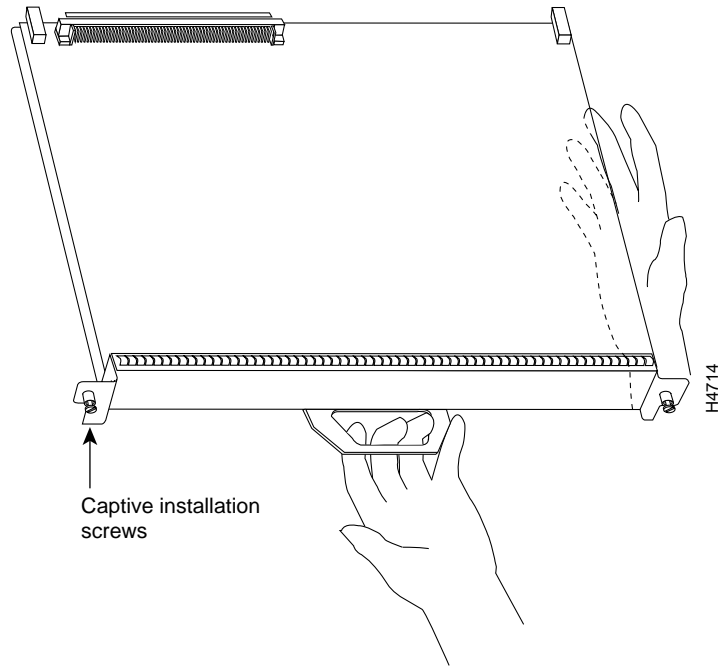
This section describes the procedure required to remove the interface processor from your system. You do not need to shut down interfaces or system power before you remove an interface processor.

Figure 1 shows proper handling of an interface processor during removal and reinstallation. Interface processors are oriented horizontally in Cisco 7010 and Cisco 7505 routers, and are oriented vertically in Cisco 7000, Cisco 7507, Cisco 7513, and Cisco 7576 routers.

Note We strongly recommend that you remove interface processors starting with the slots closest to the RSP or RSP7000.

Make a note of which slots your interface processors occupy so you can reinstall them in these same slots later.

Figure 1 Handling an Interface Processor—Horizontal Orientation



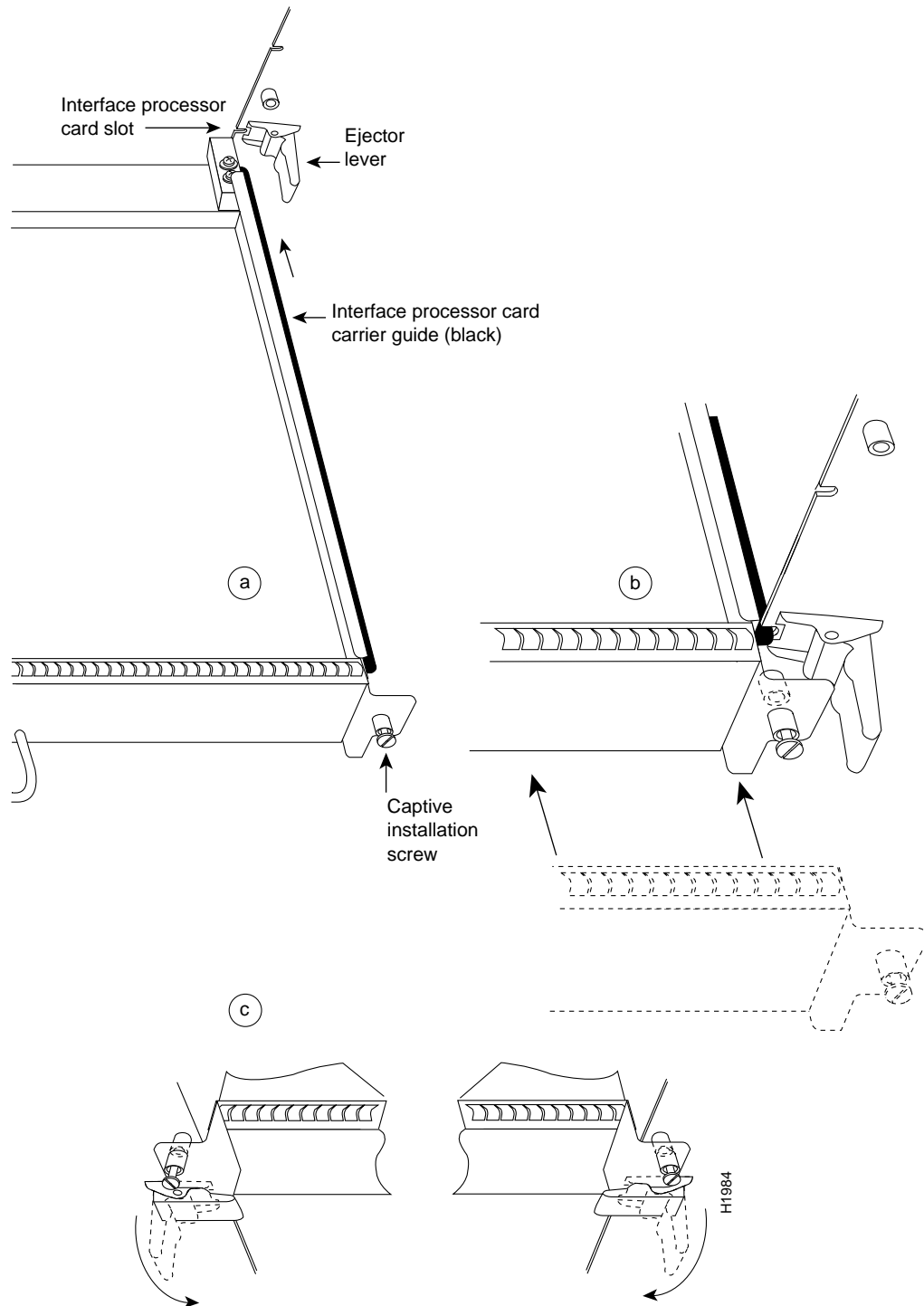
Use the following procedure to remove an interface processor:

- Step 1** Attach an ESD-preventive wrist strap between you and any unpainted chassis surface.
- Step 2** Disconnect all cables from the interface processor ports.

Note Although we strongly recommend that you remove cables from the interface processor—and doing so makes interface processor removal easier—this step is not required.

Step 3 Use a screwdriver to loosen the captive installation screws at both ends of the interface processor. (See Figure 2.)

Figure 2 Using Ejector Levers and Captive Installation Screws—Horizontal Orientation





Caution Always use the ejector levers to remove or install an interface processor. Failure to do so can cause erroneous system messages indicating an interface processor failure.

Step 4 Place your thumbs on the ejector levers and simultaneously pull both of the ejector levers outward—in the direction opposite of that shown in Figure 2c—to release the interface processor from the backplane connector.

Step 5 Grasp the interface processor handle carefully with one hand and pull the interface processor straight out of the slot; keep your other hand under the carrier to guide it. (See Figure 1.) Keep the interface processor parallel to the system backplane. Avoid touching the interface processor printed circuit board or any connector pins.



Caution To prevent ESD damage, handle interface processors by the handles and carrier edges only.

Step 6 Place the removed interface processor on an antistatic mat or antistatic foam pad.

Step 7 Repeat Steps 1 through 6 for each interface processor you plan to upgrade.

This completes the procedure for removing the interface processor. Proceed to the following section, “Upgrading DRAM.”

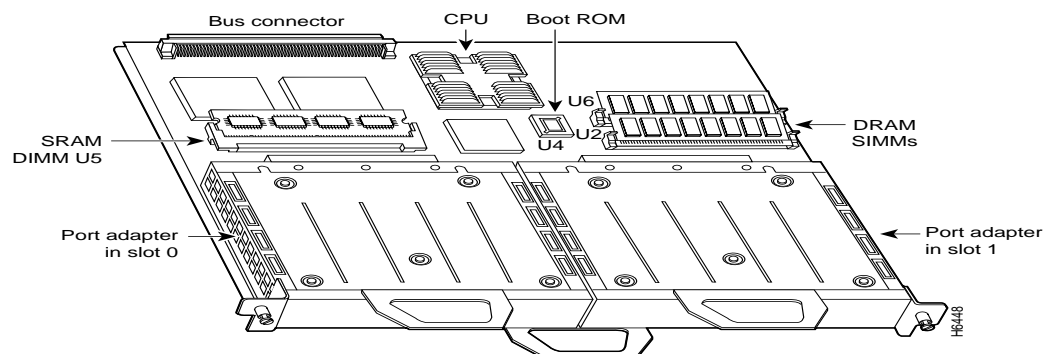
Upgrading DRAM

This section provides guidelines and the procedure for upgrading DRAM on the interface processor. The DRAM upgrade increases total interface processor DRAM from 8 MB to 16 MB. The DRAM upgrade kit VIP2-10/15/FE2-UPG= contains two 8-MB DRAM SIMMs.

The DRAM on the interface processor is contained in two 70-nanosecond (ns) SIMMs located in sockets U2 and U6. Figure 3 shows the locations of the DRAM SIMMs on the interface processor.

Note The FEIP2 has a single handle below the faceplate; it does not have port adapter handles.

Figure 3 Location of DRAM SIMMs on the Interface Processor



Note This procedure requires you to remove the two 4-MB DRAM SIMMs from sockets U2 and U6 and replace them with two 8-MB SIMMs.

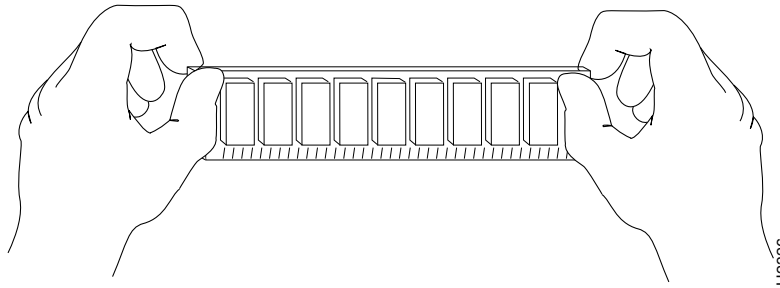


Caution To prevent ESD damage, handle DRAM SIMMs by the card edges only. Place removed SIMMs on an antistatic mat and store them in an antistatic bag.

Removing the DRAM SIMMs

This section provides the procedure for removing the DRAM SIMMs, which are sensitive components that are susceptible to ESD damage. Handle SIMMs by the edges only; avoid touching the memory modules, pins, or traces (the metal *fingers* along the connector edge of the SIMM). (See Figure 4.)

Figure 4 Handling a DRAM SIMM



Caution To prevent ESD damage, handle SIMMs as shown in Figure 4.

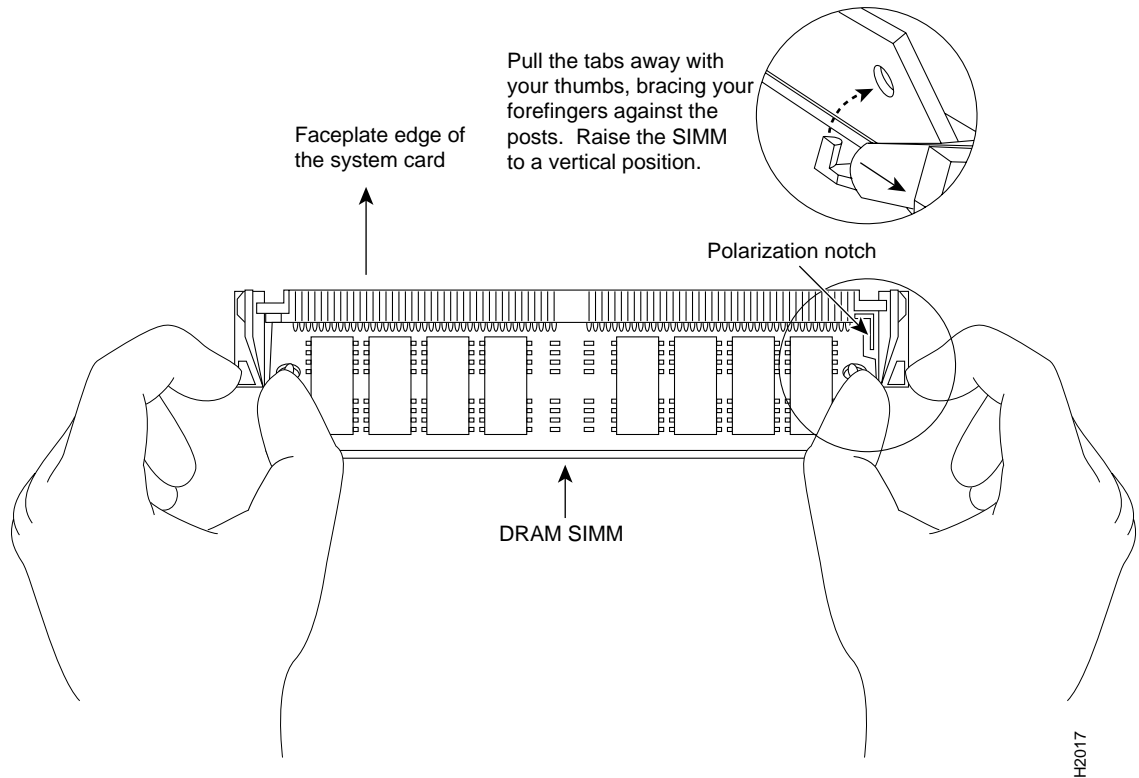
Use the following procedure to remove the SIMMs:

- Step 1** Attach an ESD-preventive wrist strap between you and any unpainted chassis surface.
- Step 2** Position the interface processor with the handle away from you and the bus connector toward you.
- Step 3** Locate the DRAM SIMMs. The SIMMs occupy sockets U2 and U6. (See Figure 3.)

Note You must replace the two 4-MB DRAM SIMMs in SIMM sockets U2 and U6 with the two 8-MB DRAM SIMMs included in your DRAM upgrade kit.

Step 4 Release the spring clips from the SIMM in socket U6 and release the SIMM from the socket. (See Figure 5.)

Figure 5 Releasing the DRAM SIMM Spring Clips



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Step 5 Grasp the ends of the SIMM with your thumb and forefinger and pull the SIMM completely out of the socket. Handle the edges of the SIMM only; avoid touching the memory module or pins, and the metal traces, or fingers, along the socket edge.

Step 6 Place the SIMM in an antistatic bag to protect it from ESD damage.

Step 7 Repeat Step 1 through Step 6 for the second SIMM.

This completes the procedure for removing the old DRAM SIMMs. Proceed to the following section to install the new DRAM SIMMs.

Installing New DRAM SIMMs

This section provides the procedure for installing the new DRAM SIMMs.

Note This procedure requires you to install the two 8-MB DRAM SIMMs in sockets U2 and U6.



Caution To prevent ESD damage, handle SIMMs as shown in Figure 4.

Use the following procedure to install new SIMMs:

- Step 1** Attach an ESD-preventive wrist strap between you and any unpainted chassis surface.
- Step 2** Position the interface processor as in the previous procedure (with the handle away from you and the bus connector toward you).
- Step 3** Remove a new SIMM from its antistatic bag or box.
- Step 4** Hold the SIMM between your thumbs and forefingers, component side up, with the connector edge (the metal fingers) away from you. (See Figure 4.)
- Step 5** Tilt the SIMM to approximately the same angle as the socket and insert the connector edge of the SIMM into the socket.

Install the first SIMM in the socket farthest from you (U2) and install the second SIMM in the socket closest to you (U6).



Caution Use firm but not excessive pressure when you insert SIMMs. If you damage a socket, you must return the entire interface processor to the factory.

- Step 6** Push the SIMM gently into the socket until the spring clips snap over the ends of the SIMM. If necessary, rock the SIMM gently back and forth to seat it properly.
 - (a) When the SIMM is installed, check the two alignment holes and ensure that the spring retainer is visible. If it is not, the SIMM is not seated properly.
 - (b) If any SIMM appears misaligned, carefully remove it and reseal it in the socket. Push the SIMM firmly back into the socket until the retainer springs snap into place.
- Step 7** Repeat Step 1 through Step 6 for the second SIMM.

This completes the procedure for installing the new DRAM SIMMs. Proceed to the following section, “Installing an Interface Processor.”

Installing an Interface Processor

This section provides the procedure for installing the interface processor after you complete the DRAM upgrade.

Figure 1 shows proper handling of an interface processor during installation. Figure 2 shows proper use of the captive installation screws and ejector levers.



Caution Install one interface processor at a time. Allow at least 20 to 30 seconds for the system to complete its discovery and initialization before you install subsequent interface processors. Disrupting the sequence before the system has completed verification can cause the system to interpret hardware failures.

Note We strongly recommend that you install interface processors starting with the slots closest to the RSP or RSP7000, and work out concentrically from there. This helps ensure protection against electromagnetic interference (EMI).

Refer to the notes you made before you removed the interface processors, so you can install them in the correct slots.

Use the following procedure to install an interface processor:

- Step 1** Attach an ESD-preventive wrist strap between you and any unpainted chassis surface.
- Step 2** Ensure that a console terminal is connected to the console port—on the RSP or RSP7000—and that your console terminal is turned on.
- Step 3** Hold the interface processor handle with one hand and place your other hand under the carrier to support the interface processor; guide it into the slot. (See Figure 1.) Avoid touching the interface processor printed circuit board or any connector pins.



Caution To prevent ESD damage, handle interface processors by the handles and carrier edges only.

- Step 4** Place the back of the interface processor in the slot and align the notch on the carrier with the groove in the slot. (See Figure 2.)
- Step 5** While keeping the interface processor parallel to the backplane, carefully slide the interface processor into the slot until the back of the faceplate makes contact with the ejector levers; and then *stop*. (See Figure 2b.)



Caution Always use the ejector levers when installing or removing interface processors. An interface processor that is partially seated in the backplane can cause the system to hang and subsequently crash, and shoving or slamming the interface processor into the slot can damage the backplane pins.

- Step 6** Using your thumbs, simultaneously push both ejector levers inward until the interface processor is pushed entirely into its slot. (See Figure 2c.)
- Step 7** Tighten both of the captive installation screws.



Caution To ensure proper electromagnetic interference (EMI) isolation for the chassis, make certain to tighten the captive installation screws on the interface processor immediately after you install it and *before* proceeding with the installation of any remaining interface processors.

- Step 8** Repeat Step 1 through Step 7 for each interface processor you removed to upgrade.

This completes the procedure for installing the interface processor. Proceed to the following section, “Checking the DRAM Upgrade.”

Checking the DRAM Upgrade

After you upgrade DRAM on the interface processor and reconnect cables, verify the upgrade by observing the LED states and the console terminal display. When the system has reinitialized all interfaces, the enabled LED on the interface processor (and on all interface processors) should go on. If the system fails to boot properly, or if the console terminal displays a checksum or memory error, check the following:

- Ensure that both DRAM SIMMs are installed correctly. If necessary, remove the interface processor. Check the DRAM SIMMs by looking straight down on them and then at board level. The SIMMs should be aligned at the same angle and the same height when properly installed. If a SIMM appears to stick out or rest in the socket at a different angle from the others, remove the SIMM and reinsert it; then replace the interface processor and reboot the system for another installation check.
- The SIMM sockets must contain SIMMs of the correct size (8 MB) and speed (70 ns) or the system does not operate; use only the DRAM SIMMs included with your upgrade kit.

If after several attempts the system fails to restart properly, contact a service representative for assistance. Before you call, make note of any error messages, unusual LED states, or any other indications that might help solve the problem.

Use the following procedure to verify that the interface processor is operating properly:

Step 1 While the system reinitializes each interface, observe the console terminal display messages and verify that the system discovers the interface processor and recognizes each interface.

Step 2 When the reinitialization is complete, verify that the enabled LED on each interface processor goes on and remains on.

- If it does, proceed to Step 5.
- If it does not, proceed to the following step.

Step 3 If the enabled LED fails to go on, suspect that the interface processor backplane connector is not fully seated in the backplane. Loosen the captive installation screws, and then firmly push both ejector levers into place until they are parallel to the faceplate. Tighten the captive installation screws.

After the system reinitializes the interfaces, the enabled LED on the interface processor should go on.

- If it does, proceed to Step 5.
- If it does not, proceed to the following step.

Step 4 If the enabled LED still fails to go on, remove the interface processor and try installing it in another available interface processor slot.

- If the enabled LED goes on when the interface processor is installed in the new slot, suspect a failed backplane port in the original interface processor slot.
- If the enabled LED still fails to go on, but other LEDs go on to indicate interface activity, proceed to Step 5, and suspect that the enabled LED on the interface processor has failed.
- If no LEDs on the interface processor go on, suspect that the interface processor is faulty.
- If the enabled LED still does not go on, contact a service representative to report the problem and obtain further instructions.

- Step 5** When the interfaces are up, check the activity of each interface by observing the status LEDs on the interface processor, which are described in the appropriate LED section of the configuration note that shipped with your interface processor or port adapter.

Note In general, if an interface LED fails to go on and a cable is connected to the port, check the cable connection and make certain it is properly seated in the connector.

If you experience other problems that you are unable to solve, contact a service representative for assistance. This completes the DRAM SIMM upgrade.

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CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously: a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, and Internet e-mail, and it is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

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- WWW: <http://www.cisco.com>
- WWW: <http://www-europe.cisco.com>
- WWW: <http://www-china.cisco.com>
- Telnet: cco.cisco.com
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact cco-help@cisco.com. For additional information, contact cco-team@cisco.com.

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This document can be used in conjunction with the installation and configuration publication that shipped with your VIP2-10, VIP2-15, or FEIP2.

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